

CLAIMS

1. An instrument insertable into a medium and being capable of detection by sonic imaging equipment comprises:
- 5 an elongate member, for insertion into said medium and having a region the position of which it is desirable to monitor;
- bubble generating means, generating a plurality of discrete mobile bubbles at said region, whereby said bubbles are detectable by sonic imaging equipment, characterised in that;
- 10 said bubble generating means comprises two elements which, upon contact with each other in the presence of a fluid, react with each other to produce said gas bubbles and in which said elements comprise first and second radially displaced layers of said elements within a fluid permeable carrier material.
- 15 2. An instrument as claimed in Claim 1 and further including a fluid permeable intermediate layer between said two element containing layers.
3. An instrument as claimed in Claim 1 or Claim 2 and further including a foundation layer on said instrument upon which are deposited said element containing
- 20 layers.
4. An instrument as claimed in Claim 3 in which said foundation layer comprises a fluid permeable layer.
- 25 5. An instrument as claimed in any one of Claims 1 to 4 and including a primer layer on said instrument upon which said fluid permeable carrier material is deposited.
6. An instrument as claimed in any one of Claims 4 or 5 and including a primer
- 30 layer on said instrument upon which said fluid permeable foundation layer is situated.

7. An instrument as claimed in any one of Claims 1 to 6 in which said carrier material comprises a hydrophilic material.

5 8. An instrument as claimed in any one of Claims 1 to 7 in which said carrier material comprises Hydrothane™.

9. An instrument as claimed in any one of Claims 1 to 8 in which said two elements comprise citric acid and sodium hydrogen carbonate.

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10. An instrument as claimed in Claim 9 in which the citric acid comprises dissolved citric acid.

11. An instrument as claimed in any one of the preceding claims in which said
15 first layer comprises a radially inner layer and comprises citric acid and said second layer comprises a radially outer layer and comprises sodium hydrogen carbonate.

12. An instrument as claimed in any one of Claims 1 to 10 in which said first layer
20 comprises a radially inner layer and comprises sodium hydrogen carbonate and said second layer comprises a radially outer layer and comprises citric acid.

13. An instrument as claimed in any one of Claims 2 to 12 in which said intermediate layer comprises a hydrophilic material.

25 14. An instrument as claimed in Claim 13 in which said hydrophilic material comprises Hydrothane™.

15. An instrument as claimed in any one of Claims 1 to 14 in which said elongate member includes a prepared surface prepared by solvent degreasing or wet blasting.

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16. An instrument as claimed in Claim 15 when having a wet blasted surface.
17. An instrument as claimed in any one of Claims 5 to 16 in which said primer layer comprises an acid etched layer.
- 5 18. An instrument as claimed in any one of Claims 5 to 16 in which said primer layer comprises a chromate free water based primer (Cytec BR6752) or Chronoflex™ AL80A.
- 10 19. An instrument as claimed in any one of Claims 1 to 18 in which the ratio of bubble generating means to carry material in said first or said second layer is between 20% and 200% by weight.
- 15 20. An instrument as claimed in any one of Claims 1 to 19 in which the ratio of the first to the second reactive agents is substantially 50/50 (by weight).
- 20 21. An instrument as claimed in any one of Claims 1 to 20 in which said bubble generating means is provided at one or more discrete portions along said elongate member.
22. An instrument as claimed in any one of Claims 1 to 20 in which said bubble generating means is provided along a substantial length of said elongate member.
- 25 23. An instrument substantially as described herein with reference to Figures 1 to - of the accompanying drawings.
24. A method of producing an instrument as claimed in Claim 1 comprising the steps of:

c) depositing onto the instrument a first layer containing a first of two elements which, upon contact with each other in the presence of a liquid, react with each other to produce gas bubbles, and

d) depositing onto the first layer a second layer containing a second of said two elements.

25. A method as claimed in Claim 24 including the further step of depositing a fluid permeable intermediate layer between said first and second layers.

26. A method as claimed in Claim 1 or Claim 24 including the further step of depositing a foundation layer on said instrument prior to deposition of said first layer.

10 27. A method as claimed in Claim 24 in which the foundation layer comprises a fluid permeable layer.

28. A method as claimed in any one of Claims 24 to 27 including the further step of depositing a primer layer onto said instrument prior to any of the layers of Claims 1 to 4.

15 29. A method as claimed in any one of Claims 24 to 28 in which the first and second layers comprise a hydrophilic material.

30. A method as claimed in any one of the Claims 24 to 29 in which said first and second layers comprise Hydrothane™.

20 31. A method as claimed in any one of Claims 24 to 30 in which said two elements comprise citric acid and sodium hydrogen carbonate.

32. A method as claimed in Claim 31 in which said two elements comprise dissolved citric acid and sodium carbonate particles.

33. A method as claimed in any one of Claims 24 to 32 in which said first layer comprises citric acid and said second layer comprises sodium hydrogen carbonate.
34. A method as claimed in any one of Claims 24 to 32 in which said first layer comprises sodium hydrogen carbonate and said second layer comprises citric acid.
- 5 35. A method as claimed in any one of Claims 25 to 34 in which said intermediate layer comprises a hydrophilic material.
36. A method as claimed in any one of Claims 25 to 35 in which said intermediate layer comprises Hydrothane™.
- 10 37. A method as claimed in any one of Claims 24 to 36 including the further step of preparing the instrument surface by solvent degreasing or wet blasting.
38. A method as claimed in any one of Claims 28 to 37 in which said primer layer comprises an acid etched layer.
- 15 39. A method as claimed in any one of Claims 28 to 37 in which said primer layer comprises a chromate free water based primer (Cytec BR6752) or Chronoflex™ AL80A.
40. A method as claimed in any one of the Claims 24 to 39 including the step of adding the first and second elements to a carrier material to form said layers and in which said elements are added to said carrier material in a ratio of between 20% and 200% by weight.
- 20 41. A method as claimed in any one of Claims 24 to 40 in which the first and second reactive elements are added in a ratio of substantially 50/50 by weight.

42. A method as claimed in any one of Claims 24 to 41 including the step of applying the layers at one or more discrete portions along said elongate member.

43. A method as claimed in any one of Claims 24 to 40 including the step of applying the layers at one or more discrete portions along said elongate member.